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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,849	11/12/2001	Larry Fabiny	019930-005600US	7263

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EXAMINER
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LAVARIAS, ARNEL C

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/992,849

Applicant(s)

FABINY ET AL.

Examiner

Arnel C. Lavarias

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-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4,8-10,12,16-18,27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,8-10,12,16-18,27 and 28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. The cancellation of Claims 5-7, 13-15, 19, and 29 in Paper No. 6, dated 9/12/03, is acknowledged and accepted.
2. The amendments to Claims 1, 9, 17, and 27 in paper No. 6, dated 9/12/03, are acknowledged and accepted.

***Response to Arguments***

3. The Applicants' arguments, see Pages 5-7 of Paper No. 6, filed 9/12/03, with respect to the rejection(s) of Claim(s) 1-2, 4-10, 12-19, 27-29 under 35 U.S.C. 102(e) and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly discovered reference to Hansen et al. (U.S. Patent No. 6234634).
4. Claims 1-2, 4, 8-10, 12, 16-18, 27-28 are rejected as follows.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1-2, 4, 8-10, 12, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton et al. (U.S. Patent Application No. US2003/0067687A1), of record, in view of Hansen et al. (U.S. Patent No. 6234634).

Barton et al. discloses a lamellar reflection diffraction grating for C-band optical telecommunication use (See Figures 3-4; paragraphs 0009-0013) comprising a substrate (See 40, 42 in Figure 3); and an arrangement of generally rectangular protrusions (See 44, 46 in Figure 3) spaced along the substrate at an average grating period  $a$  that corresponds to a line density  $1/a$  between 700 and 1100  $\text{mm}^{-1}$  (See paragraph 0028, corresponding to a line density of approximately 833  $\text{mm}^{-1}$ ) such that  $h/a > 0.5$  (See paragraph 0028, corresponding to  $h/a = 0.833$ ), and  $w/a < 0.5$  (See paragraph 0028, corresponding to  $w/a = 0.45$ ). Barton et al. additionally discloses the generally rectangular protrusions having substantially equal heights and widths, and the widths of each protrusion being defined by the FWHM measurement of a profile of such protrusion (See Figure 3). Barton et al. lacks  $w/a$  being between 0.22 and 0.30 and  $h/a$  being between 0.84 and 0.96. However, Hansen et al. teaches a diffraction grating functioning as a polarizing beam splitter (See for example 14 in Figure 1; Figures 7-8), wherein the diffraction grating exhibits the following properties (See col. 16, line 10-col. 17, line 50): the grating period is less than 0.21  $\mu\text{m}$ , the grating height/thickness lies between 0.04 and 0.5  $\mu\text{m}$  (hence  $h/a$  lies between .19 and 2.38), and the grating width with respect to the grating period lies between 0.3 and 0.76 (i.e.  $w/a$  lies between 0.3 and 0.76). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diffraction grating of Barton et al. include the properties of  $w/a$  being between 0.22

and 0.30 and  $h/a$  being between 0.84 and 0.96, as taught by Hansen et al., for the purpose of optimizing the diffraction efficiency and the throughput of the diffraction grating.

7. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoose et al. (U.S. Patent Application No. US2002/0186926A1), of record, in view of Barton et al. and Hansen et al.

Hoose et al. discloses a wavelength router (See Figures 2-6) for receiving, at an input port (See for example 37 in Figure 3), light (See 31 in Figure 3) having a plurality of spectral bands and directing subsets of the spectral bands to respective ones of a plurality of output ports (See for example 38 in Figure 3; P, P' in Figure 4), the wavelength router comprising a free-space optical train (See 34, 36, 38 in Figure 3) disposed between the input port and the output ports providing optical paths for routing the spectral bands, the optical train including a reflective lamellar diffraction grating (See 36 in Figure 3; paragraph 0044) disposed to intercept light traveling from the input port. Hoose et al. lacks the reflective lamellar diffraction grating having an arrangement of generally rectangular protrusions spaced along a substrate at an average grating period  $a$  that correspond to a line density  $1/a$  between 700-1100  $\text{mm}^{-1}$  such that  $h/a$  is between 0.84 and 0.96 and  $w/a$  is between 0.22 and 0.30. However, Barton et al. teaches the lamellar reflection diffraction grating, as set forth above, which is useful for DWDM applications in the C-band telecommunications wavelength window (See paragraphs 0004-0013). Further, Hansen et al. teaches a diffraction grating as set forth above, wherein the diffraction grating has properties such that  $h/a$  is between 0.84 and 0.96 and  $w/a$  is between 0.22 and 0.30. Therefore, it would have been obvious to one having ordinary

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skill in the art at the time the invention was made to substitute the lamellar reflection diffraction grating of Barton et al. and Hansen et al. for the diffraction grating in the wavelength router of Hoose et al. One would have been motivated to do this to provide a diffracting element that exhibits very high diffraction efficiency and reduced loss and polarization sensitivity over the wavelength range of interest, while providing optimized throughput.

### *Conclusion*

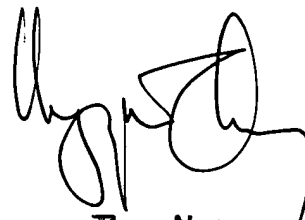
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias  
10/30/03



Zheng Nguyen  
Examiner